

ABSTRACT

An apparatus for characterizing multilayer samples is disclosed. An intensity modulated pump beam is focused onto the sample surface to periodically excite the sample. A probe beam is focused onto the sample surface within the periodically excited area. The  
5 power of the reflected probe beam is measured by a photodetector. The output of the photodetector is filtered and processed to derive the modulated optical reflectivity of the sample. Measurements are taken at a plurality of pump beam modulation frequencies. In addition, measurements are taken as the lateral separation between the pump and probe beam spots on the sample surface is varied. The measurements at multiple modulation frequencies  
10 and at different lateral beam spot spacings are used to help characterize complex multilayer samples. In the preferred embodiment, a spectrometer is also included to provide additional data for characterizing the sample.